Mitochondrial Dynamics in Cellular Bioenergetics

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Abstract. The dynamics of mitochondria play a vital role in cellular bioenergetics and metabolic regulation. This article explores the processes of mitochondrial fission and fusion, highlighting their impact on energy production and cell survival. It also discusses the implications of mitochondrial dynamics in aging and age-related diseases.

Keywords: Mitochondrial Dynamics, Cellular Bioenergetics, Fission, Fusion, Age-related Diseases

Introduction

Mitochondria, often referred to as the powerhouses of the cell, are dynamic organelles that undergo continuous cycles of fission and fusion. These processes are essential for maintaining mitochondrial function and cellular energy homeostasis. Mitochondrial dynamics influence not only the bioenergetic capacity of cells but also their ability to respond to metabolic changes and stress. Recent studies have linked altered mitochondrial dynamics to aging and various age-related diseases, such as Alzheimer's and Parkinson's. Understanding the molecular mechanisms governing mitochondrial fission and fusion presents opportunities for developing novel therapeutic approaches.

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